6. A virtual keyboard as defined in claim 4, wherein a distance between a start position and a furthest returning position that are of the information of positions detected in a time sequence is doubled to identify the position of the general key.

REMARKS

Applicant appreciates the Examiner's thorough examination of the subject application and requests reconsideration of the subject application based on the foregoing amendments and the following remarks.

Claims 1 and 2 are pending in the subject application. Claims 1-2 stand rejected under 35 U.S.C. §103, and/or 35 U.S.C. 112, first paragraph. Claim 1 also was objected to because of an identified informality.

Claim 1 was amended to address the Examiner's informality objection. Claim 2 was amended for clarity and to address the Examiner's non-art based rejection. Claims 3-6 were added to more distinctly claim Applicant's invention as well as embodiments thereof.. The amendments to the claims are supported by the originally filed disclosure.

35 U.S.C. §112, FIRST PARAGRAPH REJECTIONS

Claim 2 stands rejected under 35 U.S.C. 112, first paragraph as provided on page 2 of the above-referenced Office Action because the subject application does not disclose or teach how to determine the position of a middle position or a furthest position without the position of the general key. Because claim 2 was amended in the foregoing amendment for clarity, the following discussion refers to the language of the amended claims.

Applicant amended claim 2 in the foregoing amendment for clarity to more clearly describe the virtual keyboard according to the present invention. In this amendment Applicant removed the term middle position, not because it was not supported by the subject application but rather because it appears that the term middle was causing confusion. Applicant would note, however, that the language of pending claim 2 and the language of amended claim 2 is supported in the subject application as hereinafter provided. Accordingly, Applicant respectfully traverses and submits that the subject application does teach how to determine the middle position without having to know the position of the general key.

Applicant claims, claim 2, a virtual keyboard as defined in claim 1, which virtual keyboard includes the following additional limitations. As provided in amended claim 2, one of the received position information is a furthest returning position from the special key in the information of positions detected in a time sequence and the position of the general key is determined by doubling a distance between the special key and the furthest returning position.

As provided on pages 8-11 of the subject application, and also referring to Fig. 5, there is described the use of a keyboard according to the present invention. As described therein, if a user wants to input a capital alphabetical letter for example, the user would push the shift key, the special key, and push an alphabetic key, the general key, while keeping the shift key pressed. As further described therein, the transparent pressure-sensitive panel provides time sequenced outputs to the processor that start from a position corresponding to the X,Y position of the special key and reaches a point between the start position and the position of the general key, the furthest position. It

also is explained in the subject application that this furthest position generally corresponds to the middle position between the pushed general and special keys.

As taught in the subject application, at pages 9-10 thereof for example, the X,Y position of the general key can be determined based on the determined positions of the special key and the determined position of the furthest point (i.e., the middle point). As is also taught in the subject application at page 11 thereof, the segment from the starting point to the turning point or the furthest point is doubled to determine a corresponding position of the of the general key.

Accordingly, claim 2 satisfies the requirements of 35 U.S.C. §112, first paragraph and, therefore, this claim is allowable.

35 U.S.C. §103 REJECTIONS

Claim 1 stands rejected under 35 U.S.C. §103 as being unpatentable over Sugano et al. [USP 5,457,454; "Sugano"] in view of Prince [USP 5,581,484]. Because claim 1 was amended in the foregoing amendment, the following discussion refers to the language of the amended claim. However, given that claim 1 was amended to resolve identified informalities, none of the amended features are considered as being made to overcome the cited reference(s).

The above-referenced Office Action (see pgs. 3-4 thereof) provides that Sugano substantially discloses a virtual keyboard as claimed by Applicant except for teaching a combination of a general key and a special key is pushed at a time to output a code corresponding to the pushed combination of the special key and general key as set forth in the claim. It is further provided that Prince teaches a virtual keyboard wherein a

code, which is corresponding to a reset indication, is outputted when a combination of

several keys is pushed at a time. Thus, it is argued that it would have been obvious to

one skilled in the art to combine Prince's teachings with the virtual keyboard of Sugano.

Applicant respectfully traverses.

Applicant claims, claim 1, a virtual keyboard including a display for displaying a

keyboard, a transparent pressure-sensitive panel disposed on the display and a

processor. The processor receives information of positions detected and sent in a time

sequence from the pressure sensitive panel when a combination of a general key and a

special key in the keyboard is pushed at the same time. The processor also identifies a

position of the pushed general key according to the received position information and

outputs a code corresponding to the pushed combination of the special key and the

general key.

As pointed out by the Examiner Sugano does not teach that when a general key

and a special key are pushed at the same time a code can be outputted corresponding

to the pushed combination of the special and general keys. It should be noted that

Sugano discloses and teaches that to attain the function similar to the special key of the

present invention a user must operate a touch pad in a totally different manner from an

actual keyboard operation, which has been specified and used for many years. In

contrast to the present invention, Sugano is not directed to utilize a virtual keyboard

that is operable in the similar manner to a conventional keyboard.

Prince discloses an apparatus for manually entering information into a

computer. This apparatus includes one or more pressure sensors, preferably one

sensor for each finger of the hand and first and second acceleration sensors that are

attached proximal to each fingertip. The first and second acceleration sensors generate

first and second acceleration signals that are a function of the acceleration of the

fingertip in first and second directions respectively, where the first and second

directions are prefereably orthogonal to each other. The apparatus further includes a

signal relay device that relays the pressure and acceleration signals of each sensor back

to the computer. The computer based on these signals calculates the relative position

of each finger on a surface which in turn can be used to generate keyboard, mouse or

other forms of input data.

However, it is further explained in Prince that there must be a registration

process to establish reference points first before the apparatus can be used to input

data. In one initial calibration techniques, the fingers are arranged in some

predetermined fashion and a signal is sent to the computer to uses these as the

reference points for certain purposes such as establishing the position of certain letters

of a specific type of keyboard (see col. 8, l. 48-col. 9, l. 20). In another initial calibration

technique, letters are successively displayed on a display and the user locates his finger

at a location that will correspond to the position of the displayed letter and the

computer stores the fingertip position as the initial position for this letter. In both

techniques, a user must establish home key reference positions so the computer has in

effect a point of reference from which it can calculate the position of each finger based

on the pressure and acceleration signals as each fingertip is moved.

Prince simply teaches a system whereby the position of each fingertip is

calculated and determined based on acceleration signals and pressure signals derived

based on accelerators and pressure sensors that are attached to each fingertip. It

further teaches that based on these calculated fingertip positions, one then determines what key should be beneath the fingertip.

However, Prince *nowhere* suggests, teaches or discloses, as is taught in the subject application, that the position of the general key of a pressure-sensitive panel can be determined when both a general key and a special key of this pressure-sensitive panel are pushed at the same time. In fact there is no suggestion, disclosure or teaching anywhere in Prince as to how one could reach such a conclusion or even effect such a result when using a pressure-sensitive panel, In fact it is impossible for Prince to provide such a teaching because Prince describes a technique that uses a completely different method and apparatus for detecting the location of a fingertip than is used with a pressure-sensitive panel.

The fact that Prince is in the same field of endeavor does not make up for its shortcomings to disclose, teach or suggest how one using a transparent pressure-sensitive panel could determine the position of a general key in the case when both a special key and a general key are pressed. In sum, Prince does not teach how to modify the detection and position determination operation of a touch-sensitive panel but rather discloses and teaches a completely different method and apparatus.

The present invention results from the realization by Applicant that when two points of a touch-sensitive panel are pushed at the same time, such as when pushing of a special and general key, the coordinate of a point there between, in particular a middle point there between, is outputted by the touch-sensitive panel. Further it is realized that this would be useful to yield a virtual keyboard with a special key that is operable in the same manner as that with an actual conventional keyboard. In other

words, Applicant discovered a mechanism by which a pressure- or touch-sensitive

panel could be used in a similar manner as a conventional keyboard to generate for

example capital alphabetical character outputs that was not possible when using prior

art virtual keyboards that utilize a pressure- or touch-sensitive panel. In this way, the

virtual keyboard of the present invention overcomes the limitations and shortcomings of

such prior art virtual keyboards.

As provided in MPEP 2143.01, obviousness can only be established by combining

or modifying the teachings of the prior art to produce the claimed invention where there

is some teaching, suggestion, or motivation to do so found either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art. *In

re Fine*, 837 F. 2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F. 2d 347, 21

USPQ2d 1941 (Fed. Cir. 1992). As provided above, the references cited, alone or in

combination, include no such teaching, suggestion or motivation.

Furthermore, and as provided in MPEP 2143.02, a prior art reference can be

combined or modified to reject claims as obvious as long as there is a reasonable

expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir.

19866). Additionally, it also has been held that if the proposed modification or

combination would change the principle of operation of the prior art invention being

modified, then the teachings of the references are not sufficient to render the claims

prima facie obvious. As can be seen from the forgoing discussion regarding the

disclosures of the cited references, there is no reasonable expectation of success

provided in any of the prior art references. Also, it is clear from the foregoing discussion

that the modification suggested by the Examiner would change the principle of operation of the device disclosed in Sugano.

Assuming, arguendo, that Sugano and Prince teach what is suggested in the above identified Office Action, Applicants assert that the 35 U.S.C. § 103 rejection of the claims is still improper because the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). In order to make out a prima facie case of obviousness, there must exist in the cited references some suggestion or teaching to combine the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat App. & Inter. 1993). Moreover, the references must contain an indication that the resultant combination will be reasonably successful.

Sugano and Prince do *not* disclose all of the features claimed by Applicant nor do they teach or suggest these features.

Further, and as the Board of Patent Appeals and Interferences has held, "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without benefit of appellant's specification, to make the necessary changes in the reference device." *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ351, 353 (BD. Pat. App. & Inter. 1984).

The Federal Circuit also has indicated that a prior art reference that gives only general guidance and is not all that specific as to particular forms of a claimed invention

and how to achieve it, may make a certain approach obvious to try, but does not make the invention obvious. *Ex Parte Obukowicz*, 27 USPQ2d 1063, citing *In re O'Farrell*, 853 F.2d 894, 7 USPQ2d 1673,1681 (Fed. Cir. 1988).

It is respectfully submitted that for the foregoing reasons, claim 1 is patentable over the cited reference(s) and satisfy the requirements of 35 U.S.C. 103. As such, this claim, including the claims dependent therefrom are allowable.

CLAIM OBJECTIONS

Claim 1 was objected to, as provided on page 2 of the above-referenced Office Action because of informalities identified in lines 1 and 3 thereof.

As provided above, claim 1 was amended to address the informality concerns specifically identified by the Examiner. Applicant believes that the areas of rejection have been identified and addressed in the foregoing amendment.

Accordingly, it is respectfully submitted that claim 1 satisfies the applicable rules of the USPTO and, such, is considered to be acceptable.

CLAIMS 3-6

As indicated above, claims 3-6 were added in the foregoing amendment so as to more distinctly claim embodiments of the present invention. These claims are clearly supported by the originally filed disclosure, including the originally filed claims. It also is respectfully submitted that these added claims are patentable over the cited prior art on which the above-described rejection(s) are based.

It is respectfully submitted that the subject application is in a condition for

allowance. Early and favorable action is requested.

Although claims were added to the subject application, Applicant(s) believe(s)

that additional fees are not required. However, if for any reason a fee is required, a fee

paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized

and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,

DIKE, BRONSTEIN, ROBERTS
& CUSHMAN

Date: March 17, 2000   By: _____

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